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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/063,089	03/18/2002	Ji-Cheng Zhao	RD-29604	6423

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EXAMINER

MCNEIL, JENNIFER C

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 11/06/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

## DETAILED ACTION

### *Claim Objections*

Claims 40 and 60 are objected to because of the following informalities: both claims refer to "said at least one metal". Should this be ~~-said metal-~~? Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 47 and 48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim s 47 and 48 recites the limitation "said thermal barrier layer" in line 1. There is insufficient antecedent basis for this limitation in the claim.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 7, 11, 15-22, 26, 32, 36, 40-42, 45, 53, 54, 56-60, 63, 68-70and are rejected under 35 U.S.C. 102(b) as being anticipated by Przybyszewski (US 4,851,300). Przybyszewski teaches a coating

# Office Action Summary

Applicati n No.

10/063,089

Applicant(s)

ZHAO ET AL.

Examin r

Jennifer C. McNeil

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03/18/02.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-71 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-71 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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for the surface of superalloy components used in turbine engines. The coating comprises a layer of platinum and a layer of platinum-10%rhodium. A bond coat, considered a diffusion barrier layer, may be provided between the substrate and the metal layer. The thickness of the noble metal layers may be 2.5-5 microns each, which would give a total thickness of up to 10 microns.

Claims 1, 7, 9-11, 13-22, 26, 32, 34-36, 38-42, 45, 50, 51, and 53-60 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagaraj et al (US 5,484,263). Nagaraj teaches a reflective coating system for components of turbine engines. The coating comprises a reflective layer of platinum or platinum-rhodium. The thickness of the noble metal layer may be up to about 10 microns. A layer may be provided between the reflective layer and the substrate, and is considered a diffusion barrier layer. The barrier layer may be 0.1-25 microns thick.

Claims 1-7, 11, 15-22, 26-32, 34-36, 38-42, 44-51, 53, 54, 56-60, and 62-71 are rejected under 35 U.S.C. 102(e) as being anticipated by Darolia (US 6,558,803). Darolia teaches a protected article comprising a metal substrate and a coating system thereon. The coating system includes an iridium-containing barrier layer. The iridium layer comprises about 70-90 wt% Ir. The iridium layer may be 5-50 microns thick. A bond coat may be provided between the barrier layer and the substrate, and is considered a diffusion barrier layer. The bond coat may be 0.0005-0.005 inches thick. An outer coating of a thermal barrier is also provided. The thermal barrier layer comprises YSZ and is 0.003-0.010 inches thick.

Claims 1-3, 7, 11, 15-20, 26-28, 32, 36, 40, 45-48, 50, 51, 53-60, 63, 64, and 68-70 are rejected under 35 U.S.C. 102(e) as being anticipated by Nagaraj et al (US 6,627,323). Nagaraj '323 teaches a thermal barrier coating comprising a superalloy substrate for use as a turbine engine component, and a coating comprising a platinum-group metal. The noble metal layer may be Pt, Ru, Rh, Pd, Os, or Ir, and may have

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a thickness of 0.5-5 microns. A bond coat may be provided between the substrate and the platinum-group coating, and is considered a diffusion barrier layer. An outer coating of alumina may be provided and is considered a thermal barrier layer.

Claims 1-6, 15-22, 24-31, 40-42, 44-49, 56-60, and 62-71 are rejected under 35 U.S.C. 102(e) as being anticipated by Darolia (US 6,630,250). Darolia '250 teaches an article for a turbine engine comprising a protective coating of iridium. The protective coating comprises 70-90 wt% Ir and may have a thickness of 10-125 microns. A thermal barrier layer may be provided thereon. The thermal barrier layer may comprise YSZ and have a thickness of 0.003-0.01 inches.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8-10, 12-14, 25, 33-35, 37-39, and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Przybyszewski (US 4,851,300) in view of Spitsberg et al (US 6,306,524). Przybyszewski teaches a coating system as discussed above, including a bond coat of a MCrAlY. Przybyszewski does not give additional compositions for the MCrAlY layer. Spitsberg teaches a coating for a turbine engine component including a bond coat or diffusion barrier layer comprising an MCrAlY layer, wherein the Y may be substituted with Ru. Spitsberg also teaches that alloys with Ru are expected to form excellent diffusion barrier layers between a nickel-bases substrate and an aluminum containing outer layer. Absent a showing of unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the coating of Przybyszewski with a diffusion barrier

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layer like that of Spitsberg as it is shown to form an excellent diffusion barrier and is tightly adherent to the underlying superalloy substrate.

Claims 8-14, 23-25, 33, 37, 43, 52, 55, and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Darolia (US 6,558,813) in view of Spitsberg et al (US 6,306,524). Darolia '813 teaches a protective coating of iridium as discussed above and includes a bond coat of MCrAlX therebetween, wherein the X may be Rh, or Pt. Darolia '813 does not give additional examples of MCrAlX compositions. Spitsberg teaches a coating for a turbine engine component including a bond coat or diffusion barrier layer comprising an MCrAlY layer, wherein the Y may be substituted with Ru. Spitsberg also teaches that alloys with Ru are expected to form excellent diffusion barrier layers between a nickel-bases substrate and an aluminum containing outer layer. Absent a showing of unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the coating of Darolia '813 with a diffusion barrier layer like that of Spitsberg as it is shown to form an excellent diffusion barrier and is tightly adherent to the underlying superalloy substrate.

Claims 8-10, 12-14, 21, 22, 25, 33-35, 37-39, 41, 42, 52, and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagaraj et al (US 6,627,323) in view of Spitsberg et al (US 6,306,524). Nagaraj '323 teaches a coating system as discussed above, including a MCrAlX layer, but does not give additional examples of MCrAlX compositions. Spitsberg teaches a coating for a turbine engine component including a bond coat or diffusion barrier layer comprising an MCrAlY layer, wherein the Y may be substituted with Ru. Spitsberg also teaches that alloys with Ru are expected to form excellent diffusion barrier layers between a nickel-bases substrate and an aluminum containing outer layer. Absent a showing of unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the coating of Nagaraj '323 with a diffusion barrier layer like that of Spitsberg

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as it is shown to form an excellent diffusion barrier and is tightly adherent to the underlying superalloy substrate.

Regarding the thickness of the noble metal layer of Nagaraj '323, absent a showing of unexpected results, it would have been obvious to one of ordinary skill in the art to provide the metal layer at a thickness sufficient to provide the desired results, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

#### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer C. McNeil whose telephone number is (703) 305-0553. The examiner can normally be reached on 9-6, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (703) 308-3822. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0611.



JCM  
November 2, 2003

Jennifer C. McNeil  
Examiner  
Art Unit 1775